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(54) Title: METHODS OF MAKING HIGH-TEMPERATURE GLASS FIBER AND THERMAL PROTECTIVE STRUCTURES

(57) Abstract

A glass fiber capable of withstanding temperatures in excess of 1900 °F (1038 °C) is produced by treating a glass, preferably E-glass, fiber. The glass fiber is first leached with selected acids, and then the leached fiber is treated with organo-metallic materials of low viscosity, such as a dispersion of low molecular weight water-in-oil emulsion of dimethyl polysiloxane. The fiber is used in such applications as embedding it in a fire-resistant active coating material or embedding it into one surface of a polyolefin or composite plastic, such as a polypropylene sheet. The treated fiberglass can be used as a sole component or in concert with a fire-resistant or fire retardant material to further enhance its fire-resistant properties. Other fire-resistant composite materials are formed by precoating a fabric (1) with an active (intumescent or subliming) material (3), then embedding the precoated fabric (5) into a surface of a preferably thermoplastic sheet substrate (11). The precoated fabric is preferably adhered to or embedded in the surface of the substrate simultaneously with a molding process which forms the composite into a shape such as an automotive container like a fuel tank or trunk base. Other composites (21) are formed by adhering thermal protective structure (28) comprising a fabric (29) precoated with an active thermal protective composition (31) to a structure (23, 25, 27, 33) formed from fibers coated with an adhesive.

